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ABSTRACT

This study examined the correlation between Internet addiction, usage, and communication pleasure. Research questions were: (1) What is computer network addiction? (2) How can one measure the degree of computer network addiction? (3) What is the correlation between the degree of users' network addiction and their network usage? (4) What is the correlation between the degree of users' network addiction and their self-reported communication pleasure? and (5) What research questions are recommended for future studies on computer network addiction? A survey was distributed on the National Chiao Tung University (Taiwan) Internet bulletin board systems (BBS). The survey contained three parts: the Internet-Related Addictive Behavior Checklist (IRABC), the Pleasure Experience of Internet Usage (PEIU) questionnaire, and a demographic and network usage data questionnaire. A total of 104 valid surveys were returned. Results indicated that Internet addiction does exist among some of Taiwan's Internet users. Internet addiction scores were positively correlated with escape pleasure, interpersonal relationship pleasure, and total communication pleasure. Internet addiction scores were also positively correlated with BBS use hours or Internet use hours and total Internet use hours. It was concluded that greater communication pleasure, BBS use hours, or Internet use hours related to higher Internet addiction scores. Internet Addiction Disorder diagnostic criteria are appended. (Contains 17 references.) (MES)

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An Exploratory Study of Internet Addiction, Usage and Communication Pleasure

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An Exploratory Study of Internet Addiction, Usage and Communication Pleasure

Abstract

This paper explores Internet addiction among some of the Taiwan's Internet users. Also covered are a discussion of Internet as a form of addiction, related literature on this issue, and the Play Theory of Mass Communication. One hundred and four valid surveys were collected through a local BBS, with results indicting Internet addiction scores are positively correlated with total communication pleasure scores. The Internet addiction scores were also positively correlated with the BBSs use hours and total Internet use hours. Results concluded that higher communication pleasure, higher BBSs hours, or higher Internet hours correlated to higher Internet addiction scores, vice versa. However, the data analysis did not show a significantly positive correlation between communication pleasure scores and Internet use hours, with some exceptions. Research issues are also discussed.

Introduction

The emergence and continued growth of computer network technology has become a fact of life for many people. T.V., radio, newspapers, and magazines are awash with news about computer networks or the Internet. Our lives are now filled with a bizarre string of words beginning with "http://...." It seems that the prevalence and adoption of networks are indicators of a nation, organization, or individual who has become a member of the information society or has entered the information age.

However, is the Internet as beneficial to our future lives and work as the mass media say? Or can the Internet somehow harm our daily off-line lives? Occasionally the authors have observed some strange things. For example, in one dorm at this science- and technology-oriented university, four roommates were busy, quietly working on their PCs. They logged on the network to chat to other people – their roommates! It is so odd why they gave up face-to-face communication with quiet, on-line talking. Another example observed was how some college students cling to the Internet virtually the whole day – as long as they were awake. How is it that the Internet hooks them so, enticing them to produce such addiction-like behaviors?

Although there is still no consensus on whether or not "Internet addiction" exists, some researchers such as Brenner (1996), Goldberg (1996), Egger (1996) have investigated this

issue. In the past, the word "addiction" was confined to substance abuse, especially drugs and alcohol. As the definition has become less rigid, however, the addiction behaviors have been related to substances, activities or interactions such as sex, gambling, eating, or T.V. viewing. In the past, most research on drug addiction behaviors such as symptoms, etiology, rehabilitation, models etc. came from the psychological or medical communities (e.g., Truan, 1993) or from the political or economic communities (e.g., Orphanides & Zervos, 1995). Even in studying mass media addictions, researchers used the analog and models of drug abuse to examine the phenomenon. Finn (1992) studied whether excessive or compulsive television viewing constitutes a form of substance abuse by identifying empirical associations between drug and television use.

In this exploratory study, the researchers studied the Internet addition issue from a communication perspective rather than from psychological, political or economic perspectives. This study adopted Morris and Ogan's (1996) argument that the network in general and the Internet in particular is a mass medium, just like television or newspapers. However, apart from Finn's (1992) approach, this study did not attempt to identify empirical associations between drug and network abuse; instead, this study tried to investigate the Internet addiction on the basis of Stephenson's (1988) Play Theory of Mass Communication. The researchers assume that using the Internet generates some kind of communication pleasure experience, and it is this experience that drives users to the Internet again and again. This overuse of the Internet finally leads them to addition-like behaviors.

Based on these assumptions, the purpose of this survey study is to examine the correlations among Internet addiction, usage, and communication pleasure. The research questions of this study are:

1. What is computer network addiction?
2. How can one measure the degree of computer network addiction?
3. What is the correlation between the users' network addiction degree and their network usage?
4. What is the correlation between the users' network addiction degree and their self-reported communication pleasure?
6. What are the research questions recommended for future studies on computer network addiction?

Literature Review

Network Addiction

Although whether Internet abuse can be identified as a form of addition, just like drugs or drinking, is still debatable, network-induced addiction-like behaviors demonstrated by some network users have recently received much attention (e.g., Brenner, 1996). Addictions are generally defined in professional literature and by the lay public as uncontrollable, incurable, inherited diseases (Peele, 1986). Hatterer (1994) stated that nowadays the word "addicted" has become generalized and is no longer confined to drug abuse. The World Health Organization (WHO) defines the addiction process as:

> a state of periodic or chronic intoxication produced by the repeated consumption of a natural or synthetic drug for which one has an overpowering desire or need (i.e., compulsion)...with the presence of a tendency to increase the dose and evidences of phenomena of tolerance, abstinence and withdrawal, in which there is always psychic and physical dependence on the effects of the drug (Hatterer, 1994, p. 16)

Hatterer (1994) pointed out that, in common parlance, addictions can be related to almost any substance, activity, or interaction. People can now be said to be "addicted" to food, smoking, gambling, shopping, work, play, or sex. Truan (1993) also stated that the listing of "addictive behavior" was unending and now includes stealing, worrying, sadness, fear, child abuse, forgetfulness, television viewing, and love. Based on the less and less rigid definition of addiction adopted by the medical and psychology community, the present researchers postulate that the maladaption pattern of network use in general and Internet use in particular are forms of addiction. If so, hangover phenomena such as tension, anxiety, depression, withdrawal, guilt, mood swings, etc. or psychic and physical dependence such as dishonestly, manipulation, irresponsibility, etc. may occur because of Internet addiction.

Early research such as Shotten (1991) studied the "computer addiction" which existed in some computer scientists and technicians. These people spend most of their working time on computers, whether programming, designing hardware, or solving technical problems, and thus some can become addicted to computers. Brenner (1996) stated that the explosive growth of the Internet over the past five years, however, has almost certainly changed the profile of the "computer addict." Because the Internet provides such a user-friendly interface, gives equal access to available information, and is a convenient

medium to communicate with others, a wide range of users has become cybernetically involved on the Internet. Virtually everyone can find topics interesting to him or her, so the range of persons who use – and might abuse – computers and the Internet is wider than ever before. Thus, investigating what types of behaviors would constitute this addiction, its incidence and prevalence, or who gets addicted are challenges for us social scientists.

What are the signs or symptoms of Internet addiction? Young (1996), after having gathered four hundred case studies, provided some common warning signs for possible Net addicts:

1. compulsively checking one's E-mails,
2. always anticipating one's next Internet session,
3. others complaining that one's spending too much time online, and
4. others complaining that one's spending too much money online.

Goldberg (1996) coined a term describing such an addiction, Internet Addiction Disorder (IAD), and established a support group for Internet addicts – The Internet Addiction Support Group (IASG). He defined the "Internet Addiction Disorder" by providing seven major diagnostic criteria: hoping to increase time on the network, dreaming about the network, having persistent physical, social, or psychological problems, and so on (see Appendix 1). Goldberg's paper (1996) is as the keystone widely cited by studies in this field.

Brenner (1996, 1997) developed an "Internet-Related Addictive Behavior Checklist" (IRABC) to survey world-wide Internet users. In the first ninety days of surveys being distributed on the WWW, 563 valid questionnaires out of 654 turn-ins from 25 countries were collected. The IRABC has 32 questions such as "I have attempted to spend less time connected but have been unable to," "If it weren't for my computer, I wouldn't have any fun at all," "Most of my friends I know from the net," and so on. In his study, the average person scored 11 out of a possible 32 on the IRABC with a standard deviation of 5.89. The average survey respondent spent 19 hours per week on-line. Men and women did not differ in either their time spent on-line or number of problems. Eighty percent of the respondents indicated at least problems such as failure to manage time, missed sleep, missed meals, etc., suggesting that such patterns are in fact the norm. Some respondents reported more serious problems because of Internet use: trouble with employers or social isolation except for Internet friends; such troubles are similar to those found in other

addictions. The results also showed that younger users are more likely to report problems. The IRABC questionnaire has a good internal consistency (α=.87), and all 32 items correlate moderately with the total score, suggesting that all items measure some unique variance. Therefore, the present researchers adopted the IRABC and translated it into Chinese for this study.

Besides the IRABC, Egger (1996) at the Swiss Federal Institute of Technology in Zurich also developed on-line survey questionnaires to study network addictive behaviors. Some of the questions were based on the addiction criteria from the Internet addiction researchers and others on common symptoms of addiction. Four hundred and fifty valid responses were collected and analyzed. Among them, 84% were male and 16% female. About 10% of the respondents considered themselves as addicted to or dependent on the Internet, however, independent of gender, age or living situation. The results showed a significant difference in the answers from addicted versus non-addicted users, and the author concluded that addictive behavior can indeed exist in Internet usage.

Young (1996) at the University of Pittsburgh also conduct a WWW survey to study network addictive behaviors. Young's questionnaire consisted of 262 questions in five parts: (1) behavioral patterns, (2) personality profile, (3) level of depression, (4) sensation seeking, and (5) personal data. The results of this questionnaire will be presented at the 1997 American Psychology Association's annual meeting.

Communication Pleasure Experience

The concept and term "communication pleasure" were first developed by Stephenson in his book The Play Theory of Mass Communication (1967, 1988). This theory adopts a subjective psychological approach to the study of mass communication. It studies the subjective play, how communication serves the cause of self-enhancement and personal pleasure, and the role of entertainment as an end in itself.

Stephenson claimed that people use mass media primarily for entertainment and fun. The pleasure experience makes people feel happy, content, delighted, and certain degree of enhancement of self-existence. The play theory has 3 major points: play, convergent selectivity, and communication pleasure. Stephenson viewed play as pretending, stepping outside the world of duty and responsibility. Play is an interlude in the day and is distinguishable from work; it is voluntary and not a task or moral duty.

One of this theory's postulates is that work and play are subject to social control, and some, instead, is a matter of convergent selectivity. Social control is the way in which cultures function from the standpoint of involuntary, categorical imperatives. Social control induces conformity, consensus, and established customs or is an outcome of such conditions. In contrast, convergent selectivity is relative freedom from social control, tending toward individuality of choice in behavior and self-existence. The use of mass media is one form of convergent selectivity which allows users to immense themselves in the form and message and use their imagination and fantasize. The communication pleasure is enjoyment, contentment, serenity, delight, rapture, and maybe a bit of naughtiness, all in step in unalloyed fantasy. These are also the characteristics of entertainment, art, drama, conversation, sociability, and so on. In attendance upon it is a certain enhancement of self-existence. Mass communication, literature, drama, and the like serve for sociability and self-existence; they are vehicles for communication-pleasure – directly in the enjoyment they enjoin, and indirectly in the conversations they support.

Based on the Play theory, Huang (1994) studied the communication pleasure experience in the Karaoke TV (KTVs) in Taiwan. This study differentiated pleasure into three categories:

1. Pleasure from interaction with the text or information. Similar research includes Barthes (1975) who stated that readers experience pleasure through reading the texts itself which are interesting to them.
2. Pleasure from the interaction with other people. This is supported by Lull's (1990) study which found one's pleasure from TV viewing came from the sharing, co-viewing, and talking with family members.
3. Pleasure of the behavior itself, including the escape from real world and relief from stress or negative emotions.

This present study employs the concept of Play theory, and in particular communication pleasure, to explain why some people heavily use or become addicted to the Internet. This study tried to identify the relationship among Internet addiction, usage, and communication pleasure experience. It is assumed that Internet users experience some kind of "communication pleasure" when they use it; the more pleasure they experience, the heavier they use the Internet.

Methods

Instrument

This present study developed a survey questionnaire with 3 parts. The first part was translated from IRABC to Chinese with some revised questions to fit Taiwan's particular network environment. This part contains 32 yes-no questions. The second part,"the pleasure experience of Internet usage" (PEIU), was developed by the authors based on Stephenson's concepts of communication pleasure and Huang's (1994) qualitative study. The PEIU has 20 Likert-scale questions; subjects were required to read the statements and indicate the extent of their agreement or disagreement with one of the options on a 5-point scale: SA (Strongly agree), A (Agree), U (Undecided), D (Disagree), and SD (Strongly disagree). The third part of the questionnaire has 12 questions asking subjects about their demographic data and network usage. The questionnaire was pre-tested, with revisions made according to the pretest results.

Distribution Process

The formal questionnaire was posted on 49 boards of National Chiao Tung University's (NCTU) Bulletin Board Systems (BBSs) related to campus life, entertainment, sports, computer issues and so on. The questionnaire was distributed on the WWW rather than by mail or by phone because the researchers believe if something relates to computer, then it is more appropriate to assess it by computer, and networks directly reach target populations within the context of interest. In this case, the topic being studied was about computer network addiction and usage, so it was felt more appropriate to assess respondents' opinions by using computer networks.

However, since the study used BBSs to distribute questionnaires, sampling problems and self-selection biases may confound the study results. Without a clearly defined sampling frame, probability samples could not be drawn, thus limited the generalization of the study results. The sampling problem will be further discussed in the conclusion.

Subjects

From early to late December, 1996, a total of 111 questionnaires were answered and returned. Among 104 valid samples, 66.7% (68 respondents) were male, and 33% (34 respondents) were female. Eighty-four percent of the respondents were aged from 19 to 25, with a mean of 22.3 and a standard deviation of 3.13. About 80% of them were current students.

Results

Factor Analysis of the PEIU

The factor analysis of the pleasure experience of Internet usage (PEIU) questionnaire revealed five major factors, explained below: escape, interpersonal relationships, intertext, use behavior, and anonymity. Table 1 shows the names of the factors, explanation, accumulated explained, and reliability.

Table 1: The PEIU factor analysis results

Factor Name	Explanation	Accumulated explained	Reliability
Escape	The pleasure of relieving worries, or responsibility	22.7	.79
Interpersonal relationships	The pleasure of communicating with other people on-line	9.3	.60
Use behavior	The pleasure of using the Internet	7.7	.64
Intertext	The pleasure from interacting with the text	6.8	.54
Anonymity	The pleasure of being anonymous on-line	5.5	n/a (only one item)
			Reliability α = .855

The principal factors were differed a bit from those identified by Huang (1994). The differences were the factors of escape and anonymity. In Huang's study, "escape" was covered in "use behavior" and anonymity did not exist in Karaoke face-to-face communication situations. The present researchers however consider these two factors as important and unique to the research context, the Internet, and thus decided to distinguish them from other factors.

Internet Usage

When asked about respondents' network usage, 81.7% of those questioned used campus network facilities for free, spending an average of 19.3 hours per week on the Internet. On-line time was, on average, 9 hours on BBSs and 4.2 hours on the World Wide Web (Table 2). Note that the standard deviations for each network application were large,

implying large individual differences. As for the respondents' network experience, about 18.3% of the respondents have used the Internet for less than one year, 23.1% used it one to one and a half years, and about 20.2% have more than three years' experience (Table 3).

Table 2: The mean and standard deviation of respondents' network usage

Application names	Mean (hours)	SD (hours)
BBSs	9.04	8.25
WWW	4.26	5.12
FTP	1.99	5.01
Newsgroup	1.74	4.33
E-mail	1.72	1.76
Games	0.76	4.01
Internet Relay Chats (IRC)	0.35	0.95
Total on-line hours per week	19.31	17.17

Table 3: Respondents' network usage experience

Network usage experience	Number of respondents	Percentage
0-6 months	9	8.7
6-12 months	10	9.6
1- 1 1/2 years	24	23.0
1 1/2 - 2 years	11	10.6
2 - 2 1/2 years	14	13.5
2 1/2 - 3 years	15	14.4
more than 3 years	21	20.2

Internet Addiction Scores and Communication Pleasure Scores

The average score of the network addiction questionnaire was 13.24 (SD = 6.02) out of a total of 32, thus higher than the score of 12 reported by Brenner (1996). The reliability of the present questionnaire was 0.81. The highest score was 27; and the lowest, 2.

The communication pleasure scores were collected by the PEIU which contains 20 Likert-scale questions. For positive question such as "On the Internet, I feel I am connected to the whole network environment," "SA" counts as 5 points, "A" as 4, "U" as 3, "D" as 2, and "SD" as 1. For negative question such as "I don't think the Internet is a good way to know new friends," "SA" counts as 1 point, "A" as 2, "U" as 3, "D" as 4 , and "SD" as 5. Possible scores ranged from 20 to 100. The descriptive statistics showed that the average

score on the communication pleasure questionnaire was 50.91 with a standard deviation of 13.57.

Addicts' vs. Non-addicts' Internet Use Hours

In order to differentiate among the addicts and non-addicts from this study, a subjective, dichotomous criterion was employed. Among the total of 99 respondents who answered the first part of the questionnaire, those scoring over the mean of 13.24 (52 respondents) were grouped as addicts, while those scoring 2 to 13 (47 respondents) were grouped as non-addicts. The addict group used the Internet an average of 23.68 hours per week, while non-addicts did for 13.89. Comparing the hours which the addict group and non-addict group spent on each Internet application, shows that the addict groups spent almost twice as much time on BBSs than the non-addict group did, but spend similar hours for other applications. Table 4 lists the means and standard deviations for each Internet application for each group.

Table 4: The mean and standard deviation of Internet applications by addict group and non-addict group

	Addict group (n=52)		Non-addict group (n=47)	
Use hours per application	mean	SD	mean	SD
BBSs	11.81	9.00	6.37	6.42
WWW	4.00	3.96	4.30	6.30
FTP	2.30	5.74	1.36	6.30
Newsgroup	2.00	5.30	1.24	3.13
E-mail	2.00	1.80	1.34	1.67
Games	1.17	5.68	0.27	1.05
IRC	0.53	1.23	0.16	0.50
Total on-line hours per week	23.68	19.81	13.89	12.53

The Correlation between Communication Pleasure Scores and Internet Addiction Scores

The statistics also indicated that the total communication pleasure scores was significantly correlated with the Internet addiction scores ($r = .46$, $p<.001$). This means that higher communication pleasure experienced in Internet use accompanies higher Internet addiction scores. In particular, the escape, interpersonal relationships, and use behavior pleasures were significantly correlated with the Internet addiction scores ($r=.45$, $p<.001$; $r=.37$, $p<.001$; $r=.29$, $p<.01$ respectively).

The Correlation between Communication Pleasure Scores and Network Use Hours

The statistics also indicated that escape pleasure was positively correlated with BBSs use hours (r=.23, p=.021) but negatively correlated with Newsgroup use hours (r=-0.21, p=.36). Total Internet use hours were not significantly correlated with any pleasure factors.

The Correlation between Internet Addiction Scores and Network Use Hours

The statistics further indicated that E-mail use hours and BBSs use hours were significantly correlated with Internet Addiction scores (r=.3459, p<.001; r=.2446, p<.05). Total Internet use hours were also significantly correlated with Internet Addiction scores (r=.28, p<.01). This means that the more hours respondents spent on the Internet, the higher their Internet Addiction scores were (Table 5).

Table 5 The correlation between Internet use hours and Internet Addiction scores

Pearson correlation (r)	Internet Addiction Scores
BBSs	r=.3459***
WWW	r=-.0643
FTP	r=.0691
Newsgroup	r=.0748
E-mail	r=.2446*
Games	r=.1143
IRC	r=.1922
Total hours of Internet use	r=.2837**

***p<.001; **p<.01; *p<.05

The Difference in Internet Use Hours between the Addict Group and Non-Addict Group

The two-tailed t-test indicated that the addict group spent significantly more hours on BBSs and IRC's than did the non-addict group (t=3.43, p<.01; t=2.01, p<.05). The t-test also showed that the addict group spent significantly more hours on the Internet as a whole than did the non-addict group (r=2.90, p<.01) (Table 6).

Table 6 Internet use hours by addict group and non-addict group

Internet applications	Addict group (n=52)	Non-addict group (n=47)	t-value
BBSs	11.81	6.37	3.43**
WWW	4.00	4.30	-0.29
FTP	2.30	1.36	0.93
Newsgroup	2.00	1.24	0.84
E-mail	2.00	1.34	1.87
Games	1.17	0.27	1.13
IRC	0.53	0.16	2.01*
Total Internet use hours	23.68	13.89	2.90**

**p<.01; *p<.05

The Difference in Communication Pleasure Scores between the Addict Group and the Non-Addict Group

The two-tailed t-test indicated that the addict group had significantly higher communication pleasure scores than did the non-addict group (t=3.66, p<.001). In particular, the addict group had a significantly higher score in escape pleasure and interpersonal relationship pleasure than did the non-addict group (t=3.71, p<.001; t=3.49, p<.01) (Table 7).

Table 7 The communication pleasure score by addict group and non-addict group

Communication pleasure factors	Addict group (n=52)	Non-addict group (n=47)	t-value
Escape	14.43	12.11	3.71***
Interpersonal relationships	13.62	11.93	3.49**
Use behavior	11.24	10.40	1.90
Intertext	11.49	10.87	1.50
Anonymity	2.42	2.72	1.34
Total communication pleasure scores	53.18	48.4	3.66***

***p<.01; **p<.05

Discussions and Conclusions

The purpose of this study was to investigate the correlation between Internet users', Internet addiction, Internet usage, and communication pleasure experience. Therefore, an on-line questionnaire was posted on the BBSs to collect volunteers' responses. The questionnaire consisted of 3 parts with a total of 64 questions. The first part was the IRABC Chinese version, which gave an Internet addiction score. The second part was the

PEIU which gave a communication pleasure score. The third part collected subjects' demographic data and network usage. Analysis of the respondents' answers revealed that the IRABC Chinese version was a reliable instrument to assess respondents' Internet addiction behaviors and can thus be the base on which future related research is conducted.

The results indicated that Internet addiction does indeed exist among some of Taiwan's Internet users. It was found that the Internet addiction scores were positively correlated with escape pleasure scores, interpersonal relationship pleasure scores, and total communication pleasure scores. The Internet addiction scores were also positively correlated with both BBSs use hours and total Internet use hours. It was concluded that greater communication pleasure experience, BBSs use hours or Internet use hours related to higher Internet addiction scores, and verse visa. However, the data analysis did not support a significantly positive correlation between communication pleasure scores and Internet use hours, with the exceptions of escape pleasure scores and BBSs use hours. Figure 1 shows the three major variables and their relationships in the present research. The + sign means a positive correlation while the (+) means only a partial positive correlation between the two variables.

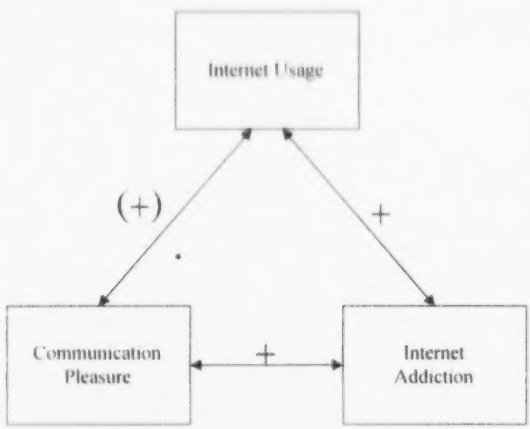

Figure 1: The three variables and their relationships in this study.

When comparing the addict and non-addict groups, it was found that the addict group spent more time on BBSs, IRC's and the Internet as a whole than did the non-addict group. The findings also revealed that the addict group had significantly higher scores in

escape pleasure, interpersonal relationships pleasure, and the communication pleasure scores than the non-addict group had. These results were consistent with the present researchers' observation that the most popular Internet application on campus was the BBSs. Students spend many hours on it monitoring the campus environment, communicating with other users, and discussing topics of interest. This finding can be supported by the pleasure scores the addict group had – they obtained more pleasure of relieving worries and responsibility and more pleasure through communicating with other people on-line.

The design and the results of this study have raised several research issues. The first is that this study only conducted statistical correlations between two of three major variables. Perhaps advanced statistical analysis such as multiple regression be employed to examine the relationships among all three major variables simultaneously to both confirm the factors of Internet addiction and build an Internet addiction predictive model.

Other research issues concern the external validity of this study. Since the questionnaire was posted on BBS boards, the respondents who answered it were self-selective but not randomly drawn. Therefore, the results of this study could only be generalized to the respondents who answered the questionnaire. It is suggested that future studies should employ the probability sampling method to enhance generalization.

A new demarcation between addicts and non-addicts should be considered. In this study, the dichotomy was based on the mean of respondents' Internet addiction scores. However, people who answered the questionnaire may vary slightly because of some human factors such as mood, health condition, etc. Next time, one could eliminate respondents who are within a 0.5 standard deviation above and under the mean. This would more clearly distinguish between addicts and non-addicts.

Still another research is the cause of Internet addiction. As mentioned above, the use of statistics limited the explanation of the results of this study. The causal relationship among the three major variables was only postulated but not tested in this study. For example, does communication pleasure lead Internet users to become addicted to the Internet? Do high Internet usage hours ultimately cause Internet addiction? In the future, in-depth interviews can be conducted to help answer these questions. Collecting Internet addicts' personal experience of addictive incidence, psychic and physical dependence,

and recovery will shed more light into the Internet addiction issue, as suggested by Brenner (1996).

This study discussed the recent research focus of Internet addiction, collected empirical data from a sample of Taiwan's Internet users, and tried to find the correlation among Internet addiction, usage, and communication pleasure. As the world becomes more and more computer-network oriented and connected, the addiction issue will become more and more serious. The present authors hope that more research will be conducted on this issue, and solutions will ultimately be found.

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Appendix 1

Goldberg's (1995) Internet Addiction Disorder (IAD) diagnostic Criteria:

A maladaptive pattern of Internet use, leading to clinically significant impairment or distress as manifested by three (or more) of the following occurring at any time in the same 12-month period:

1. Tolerance, as defined by either of the following:
   - 1.1 a need for markedly increased amounts of time on the Internet to achieve satisfaction
   - 1.2 markedly diminished effect with continued use of the same amount of time on Internet
2. Withdrawal, as manifested by either of the following:
   - 2.1 the characteristic withdrawal syndrome
     - 2.1.1 cessation of (or reduction) in the Internet use that has been heavy and prolonged
     - 2.1.2 two (or more) of the following, developing within several days to a month after criterion 2.1.1
       - 2.1.2.1 psychomotor agitation
       - 2.1.2.2 anxiety
       - 2.1.2.3 obsessive thinking about what is happening on the Internet
       - 2.1.2.4 fantasies or dreams about the Internet

2.1.2.5 voluntary or involuntary typing movements of the fingers

2.2 use of Internet or a similar on-line service is engaged in to relieve or avoid withdrawal symptoms

3. Internet is often accessed more often or for longer periods of time than was intended
4. There is a persistent desire or unsuccessful efforts to cut down or control Internet use
5. A great deal of time is spent in activities related to Internet use (e.g., buying Internet books, trying out new WWW browsers, researching Internet vendors, organizing files of downloaded materials)
6. Important social, occupational, or recreational activities are given up or reduced because of Internet use.
7. Internet use is continued despite knowledge of having a persistent or recurrent physical, social, occupational, or psychological problem that is likely to have been caused or exacerbated by Internet use (sleep deprivation, marital difficulties, lateness for early morning appointments, neglect of occupational duties, or feelings of abandonment in significant others)